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EXAMINER

KORNAKOV, MICHAEL

ART UNIT

PAPER NUMBER

1746

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7

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-7

Office Action Summary

Application No.

10/043,190

Applicant(s)

NOGAMI, HIROSHI

Examiner

Michael Kornakov

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 8 and 19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-7,9,13 and 15-22 is/are rejected.
- 7) ☒ Claim(s) 3 and 10-12 is/are objected to.
- 8) ☒ Claim(s) 1-22 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species of the claimed invention:

- the specie of the cleaning gas wherein the cleaning gas is fluoride gas, as recited by the instant claims 4 and 15
- the specie of the cleaning gas, wherein the cleaning gas is O₂, as recited by the instant claims 8 and 19.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1 and 13 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

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Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

2. During a telephone conversation with Ms. S. Ferrett, esq., on 06/12/2003 a provisional election of specie of fluoride cleaning gas, as per the instant claims 4 and 15 was made. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8 and 19 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Drawings

3. The drawings filed on 01/14/2002 are acceptable subject to correction of the informalities indicated on the attached "Notice of Draftperson's Patent Drawing Review," PTO-948.

4. Figures 1-3 should be designated by a legend such as --Prior Art--because, while reciting "A method of cleaning a CVD vaccum vessel", Applicant is apparently relying on the description of such vessel, provided in Japan Patent Application H11-157692 (see page 5, paragraph 0018) and therefore, that which is old is illustrated. See MPEP § 608.02(g). The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claim 13 is objected to because of the following informalities: the preamble of Claim 13 is repleted with structural and functional language. Applicant is suggested to clarify the issue and correct the preamble of claim 13.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 21 and 22 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 21 recites the limitation step of "the heating of said electrically conductive partition". There is insufficient antecedent basis for this limitation in the claim. Claim 22 is rejected because of its dependency.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 2, 4, 5, 13, 15, 16 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 2000-345349.

JP'349 teaches cleaning a CVD vacuum vessel which has an electrically

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conductive barrier wall (compare to "partition plate, as instantly claimed") with plurality of through holes and wherein the condition for gas diffusion through said holes is met according to the instant claim 13, the said cleaning includes grounding the barrier wall, feeding NF₃ gas into the plasma production space, generating plasma by applying RF power to electrodes and diffusing fluorine radicals into the film deposition processing space through the holes of barrier wall (Fig 1,3; paragraphs 0016, 0021,0040).

Therefore, all the limitations of instant claims are met by JP'349.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 6, 7, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-345349 in view of Powell (U.S. 6,538,734).

JP'349 teaches cleaning of CVD chamber with plasma species produced from

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NF₃ cleaning gas and provides for the supply of oxygen for deposition purposes (paragraph 0038), however remains silent about adding oxygen gas to the cleaning gas during the cleaning procedure.

The addition of oxygen to the cleaning fluorine containing gas is conventionally utilized in semiconductor industry for the removal of polymers and other etch byproducts from the inside surfaces of semiconductor processing chambers, as indicated by US'734, col. 8, lines 30-34). Therefore, one skilled in the art at the time the invention is made, motivated by the disclosure of US'734 and design of apparatus of JP'349, which specifically provides for oxygen supply means, would have found it obvious to add oxygen gas in the fluorine containing cleaning gas of JP'349 in order to enhance cleaning of film deposition space of JP'349 and thus to arrive at the limitations as instantly claimed.

13. Claims 9 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-345349 in view of Varhue (U.S. 6,313,017).

JP'349 remains silent about adding the inert gas to the cleaning gas while cleaning the CVD chamber. However, the mixtures of fluorine containing gas and inert gas are routinely utilized for CVD chamber cleaning. Thus, Varhue teaches that it is preferably to clean the CVD chamber, applying a plasma, produced from Ar and NF₃ (col. 7, lines 39-43). Therefore, one skilled in the art at the time the invention is made, motivated by the disclosure of Varhue would have found it obvious to introduce inert gas, such as Ar, into fluorine containing cleaning gas of JP'349 in order to provide

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uniform cleaning of film deposition space of JP'349 and thus to arrive at the limitations as instantly claimed.

Allowable Subject Matter

14. Claims 3, 10-12 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. Claims 21 and 22 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter: While teaching cleaning a CVD vacuum vessel which has an electrically conductive barrier wall with plurality of through holes and wherein the cleaning includes feeding cleaning gas into the plasma production space, generating plasma by applying RF power to electrodes and diffusing fluorine radicals into the film deposition processing space through the holes of barrier wall, JP'349 fails to anticipate or suggest fairly the step of heating the barrier wall.

The step of heating the barrier (partition) wall while cleaning the inside surfaces of processing space of semiconductor chamber has not been located as of the date of this office action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Kornakov whose telephone number is (703) 305-0400. The examiner can normally be reached on 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (703) 308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872 9310 for regular communications and (703) 872 9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 2450.

M. Kornakov

Michael Kornakov
Examiner
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June 16, 2003